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BEESWAX

The Department has no publications on the processing and utilization of beeswax. The chief uses for beeswax are in the manufacture of polishes of various kinds, wax candles (chiefly for sacramental purposes), cosmetic preparations, comb foundations for the beekeeping industry, sealing and grafting waxes, and for modeling purposes. According to well-informed sources in the industry, the annual domestic production of beeswax has varied between 3,000,000 and 5,500,000 pounds in recent years.

Various methods* are used for rendering the wax from the combs. The two methods commonly employed involve the use of hot water and steam-heated presses of various types. When using steam-heated presses, the comb is kept hot by steam during the expression of the wax. In this process the wax drops down from the press and is drained off; but with the hot water-press method the whole process is conducted under hot water and the liberated wax rises to the surface where it is removed. A third method of rendering is based on melting the combs, transferring the molten mass into burlap bags and pressing without delay, no additional heat being supplied. A less efficient method is to boil the combs with water and skim off the wax which rises to the surface. In some localities "cappings" and fresh combs are placed in solar-extractor cabinets and the wax which is melted by the heat of the sun drains into a lower compartment where it solidifies.

If beeswax of acceptable, light color is to result, it should not be melted or rendered in equipment* of uncoated iron as the compounds resulting from the reaction between crude beeswax and ordinary iron or steel are dark colored and darken the wax. Also, contamination of the wax with either iron rust or other iron compounds seriously interferes if it is to be bleached.

After the wax has been extracted, it usually contains finely divided foreign matter for the removal of which several different procedures are used. One method is to pour the melted wax into a well insulated wooden vat containing water to the depth of 1 or 2 inches and allow it to stand until it is about to solidify. At this stage, the wax is dipped carefully (so as not to disturb the lower part where the foreign matter has settled) and transferred into suitable vessels where it is allowed to solidify. After the wax remaining in the vat has solidified, it is removed and the portion containing the settled dirt is cut away. If this contains much wax it may be kept and added to the next lot of wax to be melted.

*More detailed information on equipment and methods for the recovery of wax from the comb may be obtained from the references listed herein.

Bleaching Beeswax

Wax from different sources varies greatly with regard to the ease or difficulty of bleaching, and some of it cannot be bleached satisfactorily, even by drastic chemical means. Although various agents and methods have been suggested for this purpose, only the bleaching of the wax by exposure to direct sunlight is briefly described. For this method of bleaching the clarified wax is extruded in the form of thin ribbons. These are cut into convenient lengths and the pieces placed in a single layer in perforated trays which are exposed to direct sunlight. Each day the wax is sprinkled with water and once or twice a week the wax ribbons are turned over. This treatment is continued until it has bleached, or fails to bleach further. Depending upon the character of the wax, its bleaching by this method may require anywhere from 2 to 6 weeks' exposure to sunlight.

Characteristics

Beeswax melts from 62° to 66° Centigrade (143° to 151° Fahrenheit). The density of 20° C. (68° F.) usually ranges from 0.950 to 0.970; the acid value, from 16.4 to 24.0; the saponification value, from 87 to 96; the ester value, from 70 to 80; and the iodine number, from 5.4 to 13.6.

Recipes for Wax Coatings or Polishes

Recipes for polishes and other preparations made with beeswax may be found in recipe books or formularies, a few of which are included in the list of references.

References

ABC and XYZ of Bee Culture. By A. I. and E. R. Root. Ed. 1940. Published by A. I. Root Co., Medina, Ohio.

Chemical Technology and Analysis of Oils, Fats and Waxes. By J. Lewkowitsch. Ed. 6. 1923. Published by MacMillan & Co., London, England.

The Hive and Honeybee. By L. L. Langstroth and Charles and C. P. Dadant. Ed. 23. 1927. Published by American Bee Journal, Hamilton, Ill.

Beekeeping. By E. F. Phillips. Ed. 2. 1928. Published by The MacMillan Co., New York, N. Y.

Scientific American Cyclopedia of Formulas.

Henleys' 20th. Century Book of Recipes.

The Chemical Formulary (Bennett). Vols. 2 and 3.

These books are to be found in many city libraries and those of universities and agricultural experiment stations.

March 15, 1940.

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